

Amendments to the Drawings:

Applicant has submitted with this response a proposed replacement drawing sheet for Sheet 1 of 3 of the originally submitted drawings. Four reference numerals found in the originally submitted drawing sheet have been deleted in the proposed drawing sheet consistent with the Examiner's appropriate determination that the drawings contained reference numerals not found in the specification. No other changes have been made to the drawings.

Attachments:

- 1 Replacement Sheet*
- 1 Annotated Sheet Showing Changes*

REMARKS/ARGUMENTS

Claims 1-20 were pending and examined. The Examiner indicated objections to the drawings, specification, and claims. The Examiner rejected claim 1 under 35 USC § 112, second paragraph, as being indefinite. The Examiner rejected claims 1-5 under 35 USC § 103(a) as being unpatentable over Horspool *et al.* (U.S. Patent No. 6,653,994), hereinafter "Horspool", in view of Aharoni *et al.* (U.S. Patent No. 6,014,694), hereinafter "Aharoni". Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Horspool in view of Aharoni, and further in view of Sweitzer *et al.* (U.S. Patent No. 6,535,551), hereinafter "Sweitzer". Claims 7-11, 13, and 15-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Horspool in view of Aharoni, and further in view of Eldreth (U.S. Patent No. 6,721,795), hereinafter "Eldreth". Claims 12 and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Horspool in view of Aharoni, in further view of Eldreth, and further in view of Sweitzer. The Examiner rejected claim 14 under 35 USC § 103(a) as being unpatentable over Horspool, Aharoni, and Eldreth, and in further view of Greenberg (U.S. Patent No. 6,791,974, hereinafter "Greenberg". The Examiner rejected claim 20 under 35 USC § 103(a) as being unpatentable over Horspool, Aharoni, and Eldreth, in further view of Parker *et al.* (U.S. Patent No. 5,495,205), hereinafter "Parker". In this response, Applicant has amended claims 1, 5-7, 11, 15, and 18, canceled claims 2, 8, and 16, and added claims 21-23. Claims 1, 3-7, 9-15, and 17-23 remain pending.

Drawing Objections

The Examiner objected to originally submitted FIG. 2 because it included reference characters not mentioned in the description. In response, Applicant has submitted a proposed replacement drawing page for sheet 1 of 3 of the originally submitted drawings. The offending reference numerals have been removed from the proposed replacement sheet. No other changes have been made. Applicant respectfully requests the Examiner to accept the proposed drawing sheet and withdraw the objection.

Specification Objections

The Examiner objected to the duplicate use of reference numeral 211 in the specification as originally filed. In response, Applicant has amended the specification to replace reference numeral 211 with reference numeral 141 in the single instance where reference numeral 211 was inadvertently used in reference to buffer logic 141. Applicant wishes to thank the Examiner for diligently reviewing the application and discovering this error. Applicant submits that the specification as amended addresses the objection raised by the Examiner and Applicant would respectfully request the Examiner to reconsider and withdraw the objection.

Claim Objections

The Office Action indicated objections to informalities in claims 1-2, 5-7, 11, 15, and 18 as filed. In response, Applicant has amended each of the objected-to claims (with the exception of claim 2, which has been canceled). Again, Applicant wishes to thank the Examiner for discovering these errors. Applicant submits that these claims as amended address the objections raised by the Examiner and Applicant would respectfully request the Examiner to reconsider and withdraw the objections.

Claim rejections under 35 USC § 112

The Examiner rejected claim 1 under Section 112, second paragraph, as being indefinite. In response, Applicant has deleted the work "materially" from independent claims 1, 7, and 15. Applicant believes claims 1, 7, and 15 as amended are fully compliant with the requirements of Section 112, second paragraph.

Claim rejections under 35 USC § 103(a)

The Examiner rejected claims 1-5 under Section 103(a) as being unpatentable over Horspool in view of Aharoni. In response, Applicant has amended independent claim 1 to incorporate the limitations of previously submitted claim 2 (now canceled). Applicant submits that the elements of claim 1 as amended are not taught or suggested by the cited references because neither Horspool nor Aharoni teach or suggest the concept of reducing the operating frequency of a communication link in response to determining that a link is underutilized from a bandwidth perspective.

Horspool teaches reducing the operating frequency of a link in response to determining that the link is exhibiting excessive errors. In sharp contrast to claim 1 as amended, Horspool teaches operating the data communication link at the highest possible frequency or data rate. Only upon discovering that a link exhibits excessive errors when operated at a particular operating frequency does Horspool intervene by reducing the operating frequency of the link. Thus, Horspool does not respond to a determination that the current bandwidth of a link is different than the effective data rate by configuring the link to operate at the lowest possible frequency sufficient to handle the effective data rate. Horspool reduces operating frequency of a link without regard to the effective data rate. Horspool merely determines that, when a link and the hardware elements connected to a link have defects that prevent the link from operating at a particular frequency without exhibiting excessive failures, the link operating frequency is modified as an undesirable concession.

Rejection claim 2 as originally filed, the Office Action indicated that Horspool discloses where the modified operating frequency is the lowest operating frequency accommodate by the link that is sufficient to handle the effective data rate. Applicant disagrees. The modified operating frequency in Horspool is not the lowest frequency sufficient to handle a specific bandwidth requirement. The modified operating frequency in Horspool is the highest operating frequency that does not exhibit data errors. In other words, in direct contrast to the amended claim's emphasis on operating at the lowest acceptable frequency (i.e., the lowest frequency with sufficient bandwidth to accommodate the actual data traffic on the link), Horspool is exclusively devoted to operating the link at the highest acceptable frequency (i.e., the highest frequency that does not result in data errors).

One skilled in the art of networks and network communication links having the benefit of Horspool would not have been motivated by Aharoni's disclosure of measuring the actual bandwidth of a communication link to substitute an effective data rate in place of the measured error rate because Horspool is concerned exclusively with operating at the highest possible level of performance that does not produce errors.

The Examiner rejected claims 7-11, 13, and 15-18 under Section 103(a) as being unpatentable over Horspool in view of Aharoni, and further in view of Eldreth. In response, Applicant has amended independent claims 7 and 15 (and canceled claims 8 and 16) to recite claim limitations analogous to the claim limitations recited in amended claim 1. For reasons analogous to the reasons argued above with respect to amended claim 1, Applicant respectfully submits that amended independent claims 7 and 15 as amended recite elements neither taught nor suggested by the cited references.

In addition to the foregoing, Applicant has introduced a new independent claim 21 that recites a computer program product for conserving energy in a data processing network by detecting an underutilized link between a switch and a server and responding by reducing the operating frequency of the link. Support for this claim language is found in the specification as originally filed. See, e.g., the paragraph beginning on line 10, page 6 of the specification as filed.

The cited references do not teach or suggest a program product that detects underutilized links and responds by reducing the operating frequency of those links. Horspool is concerned

with establishing the maximum link operating frequency that does not outpace its hardware (and thereby produce errors). Aharoni is concerned with compressing data sufficiently that it will not exceed the maximum capacity of the data link. Both of these references suggest that data links are best operated at the highest possible operating frequency that does not produce hard errors. Neither of these references views the link operating frequency as a power consumption parameter that should be adjusted (reduced) when maximum capacity is not needed or useful.

New claim 22 incorporates all of the limitations of claim 21 and, in addition, recites instructions for determining the effective data rate. The Examiner correctly acknowledges that Horspool does not teach or suggest this element. The Examiner relies (with respect to other claims) on Aharoni for disclosing the concept of measuring a link's actual data rate. Applicant respectfully submits that Aharoni does not teach a method of determining the actual data, but instead teaches a measurement technique for determining the actual maximum data rate of a link. Specifically, FIG 10 and its corresponding description in Aharoni describe a technique for increasing the amount or rate of data sent at one end of a link until no corresponding increase in receive data rate is detected at the other end. When the receive data rate approaches a maximum value, the maximum value is taken as the physical bandwidth of the link. This measure has nothing whatsoever to do with the effective data rate with which the claim under consideration is concerned. The effective data rate is a measure of how much data is being sent across a link regardless of how much data could be sent. Accordingly, Applicant believes that claim 22 recites elements that are neither taught nor suggested by the cited references.

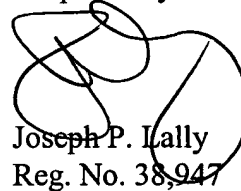
Finally, new claim 23 further recites that the claimed program product includes instructions to detect over-utilization of a link and instructions to respond by increasing the link operating frequency. Neither Horspool nor Aharoni describe increasing link operating frequency to accommodate excessive load. As argued above, both Horspool and Aharoni are concerned with operation at the maximum frequency of the link. For some of the same reasons that neither Horspool nor Aharoni teaches or suggests reducing the frequency of a data channel. Similarly, Sweitzer, which is relied upon in rejecting an analogous claim limitation in claim 6, like Horspool, is concerned with determining an appropriate data rate based upon the physical capacity of the link to transmit data. Sweitzer describes measuring bit error rates, attenuation

parameters, and the like to determine an appropriate data rate. Like Horspool and Aharoni, this approach is grounded on the concept of operating the link at some maximum sustainable data rate. Accordingly, Applicant submits that new claim 23 recites limitations that are neither taught nor suggested by the cited reference.

CONCLUSION

In the present response, Applicant has addressed the objections to the drawings, specification, and claims, and responded to the Examiner's claim rejections under 35 USC § 112, second paragraph and 35 USC § 103(a). Accordingly, Applicant believes that this response constitutes a complete response to each of the issues raised in the office action. In light of the amendments made herein and the accompanying remarks, Applicant believes that the pending claims are in condition for allowance. Accordingly, Applicant would request the Examiner to withdraw the rejections, allow the pending claims, and advance the application to issue. If the Examiner has any questions, comments, or suggestions, the undersigned attorney would welcome and encourage a telephone conference at 512.428.9872.

Respectfully submitted,

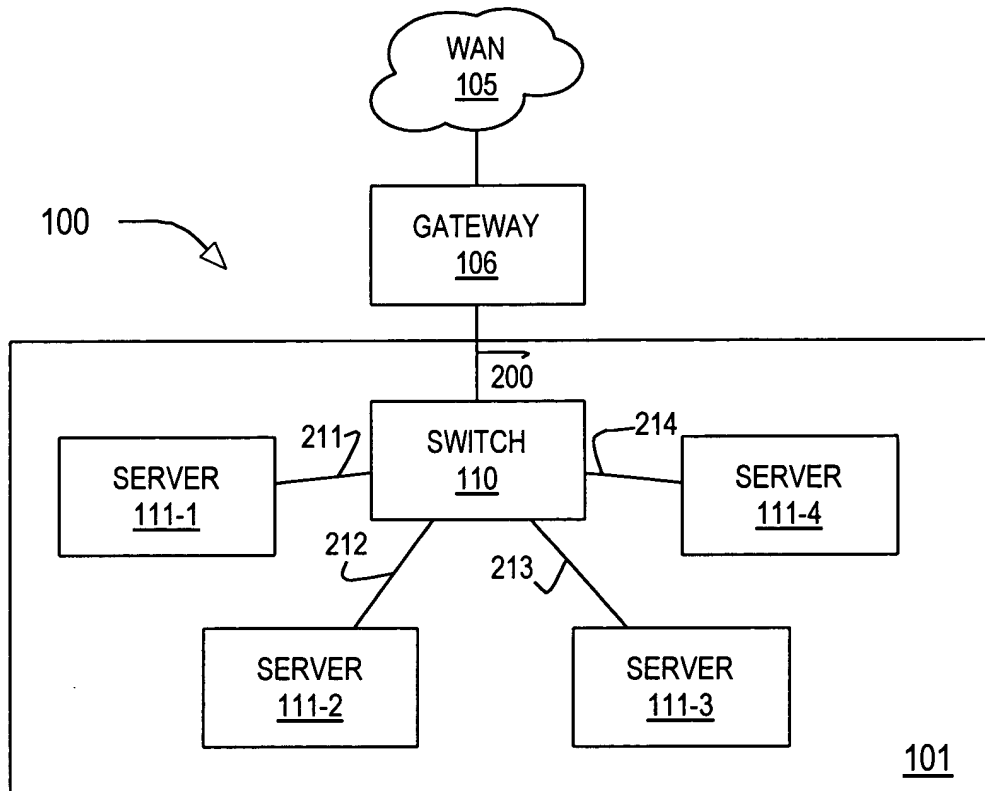


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JPL/mmm

Attachments



DELETE INDICATED FIG. 1
REFERENCE NUMERALS

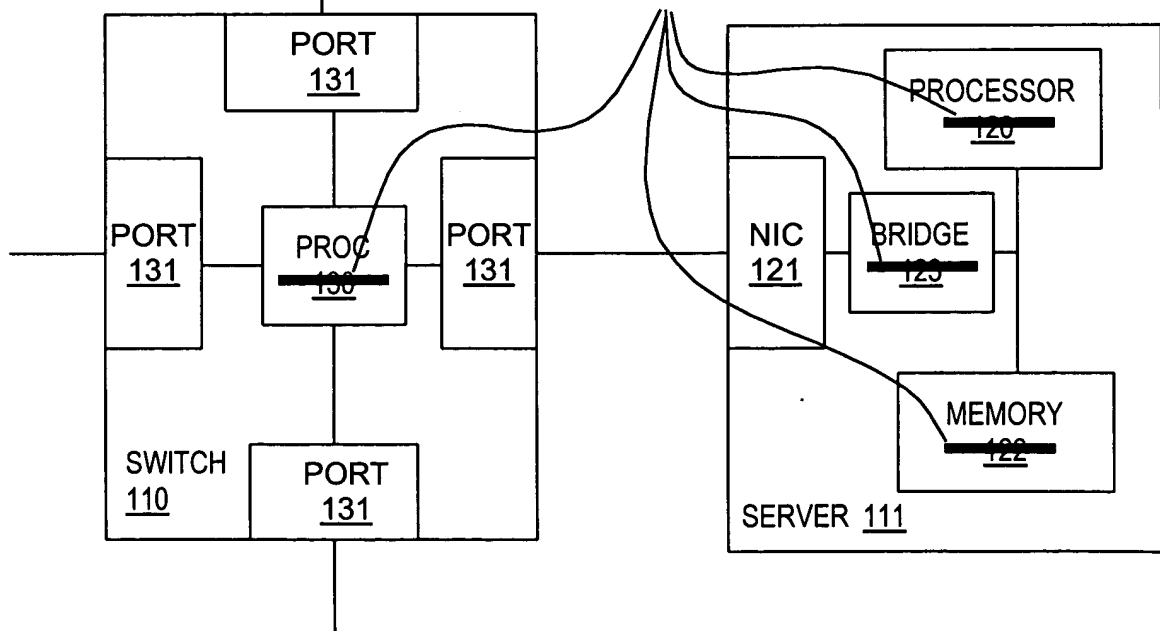


FIG. 2